# Protecting the Planet: A Case Study on the Sustainability and Conservation Practices of the National Park Service

A Senior Project

presented to

the Faculty of the Department of Experience Industry Management

California Polytechnic State University, San Luis Obispo

In Partial Fulfillment

of the Requirements for the Degree

Bachelor of Science

by

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June, 2019

ABSTRACT

PROTECTING THE PLANET: A CASE STUDY ON THE SUSTAINABILITY AND CONSERVATION PRACTICES OF THE NATIONAL PARK SERVICE

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JUNE, 2019

Sustainability and conservation practices are becoming increasingly more important for the health of the planet. Individuals and organizations implementing these practices can help stop the planet from degrading beyond a point of recovery. The purpose of this study was to examine the environmental sustainability and conservation biology practices of the National Parks Service. The organization's website was the primary source of information in addition to third party sources including other organizations' websites. Major findings and conclusions of the study include the National Park Service's commitment to constantly improving the technology and techniques implemented, the organization's dedication to sustainability and conservation projects, and the quick action and sustainable decision making that are incorporated into the organization. Some recommendations include continuously educating employees on better ways to recognize troubled species, remaining educated on new technology that emerges to help improve current practices, and continuously implementing practices that maintain and enhance natural resources.

Keywords: National Park Service, sustainability, conservation biology, natural environment, parks, practices

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# Chapter 1

# INTRODUCTION AND REVIEW OF LITERATURE

## Background of Study

The survival of the human race depends entirely on the survival of the planet. Without a healthy and thriving planet, the quality of life for all living things that inhabit it would be diminished considerably. According to scientists, “The planet's average surface temperature has risen about 2.0 degrees Fahrenheit (1.1 degrees Celsius) since the late 19th century, a change driven largely by increased carbon dioxide and other human-made emissions into the atmosphere” (Earth Science Communications Team, 2017). This change in the global climate, while it may seem small, drastically impacts the earth in a variety of ways including: global temperature rise, warming oceans, shrinking ice sheets, extreme events, and ocean acidification (National Aeronautics and Space Administration, 2019). These kinds of environmental events are putting the survival of all living things at risk. Plants and animals all around the world are dying which can cause major shifts in the ecosystems that they live in and those shifts can have a negative impact on several other ecosystems as well. All living things are connected and these shifts in ecosystems will continue to work their way through one another until they eventually come to affect humans. The everyday actions that humans and organizations choose to take have the potential to continue to degrade the environment and speed up the negative effects of climate change. However, humans can also choose to take actions towards improving the environment and preventing any further degradation.

Some actions that humans (and organizations) can take include adopting more sustainability and conservation practices into their lives and taking the health of the planet more seriously. Environmental sustainability and conservation biology practices are continually being improved and implemented by organizations in order to contribute to the efforts of taking care of the planet. Organizations within the outdoor industry are just one facet that is working to improve the sustainability and conservation practices that are implemented, as well as adopt new practices which would better protect the natural environment. These types of practices are especially important for said organizations because the services they provide to the public primarily take place within the natural environment. The purpose of this study was to examine the environmental sustainability and conservation biology practices of the National Park Service.

## Review of Literature

Research for this review of literature was conducted at Robert E. Kennedy Library on the campus of California Polytechnic State University, San Luis Obispo. In addition to books and other resources, the following online databases were utilized: Google Scholar, JSTOR, ProQuest, Science Direct, and Springer Link. This review of literature includes the following subsections: environmental sustainability, conservation biology, and organizational practices in environmental sustainability and conservation biology.

Environmental sustainability and conservation biology are two concepts that are becoming increasingly more present as scientists continue to provide evidence informing the public that the planet's worsening condition is becoming more critical. Sustainability

has historically been a difficult term to define with many different interpretations of the word arising over time. As defined by McMichael, Butler, and Folke (2003), "sustainability means transforming our ways of living to maximize the chances that environmental and social conditions will indefinitely support human security, well-being, and health" (p. 1919). According to Ehrenfeld (2005), sustainability can also be defined as "the possibility that all forms of life will flourish forever" (p. 24). While there are several different definitions of the word, both definitions that were stated include the importance of the ability for living things to survive and also to thrive indefinitely based upon the resources that the planet provides. In addition to sustainability, conservation biology is another concept that often works together with sustainability due to the fact that both aim towards a common goal of environmental protection and the survival of all species on the planet.

According to Soulé (1985), conservation biology "addresses the biology of species, communities, and ecosystems that are perturbed, either directly or indirectly, by human activities or other agents" (p. 727). Human beings often "extract energy, materials, and organisms from nature and modify landscapes at rates that cannot be sustained" (Trombulak et al, 2004, p. 1180). Conservation biology can not only be utilized to educate people of the harmfulness of these actions, but can also be used to attempt to prevent these actions from taking place at all. Unfortunately, the actions that were stated above "have resulted in accelerated rates of extinction, degradation, and loss of ecosystems, and disruption of the natural systems in which our cultures are embedded" (Trombulak et al., p. 1180). Both environmental sustainability and conservation biology practices can be used either separately or in addition to one other in order to minimize the

negative effects of these actions. There are other more specific concepts that are often associated with environmental sustainability and conservation biology that can easily be incorporated into the daily lives of human beings and can also inspire them to take certain influential actions.

Environmental stewardship and natural resource management are two of these more specific concepts associated with environmental sustainability and conservation biology. According to Worrell and Appleby (2000):

> Stewardship is the responsible use (including conservation) of natural resources in a way that takes full and balanced account of the interests of society, future generations, and other species, as well as of private needs, and accepts significant answerability to society. (p. 269)

It is not hard to see that this definition contains many similarities when compared to the definitions of environmental sustainability and conservation biology and can easily be connected to both concepts. Mathevet, Bousquet, and Raymond (2018) stated, "stewardship is often used as a simple rewording for wise resource use or sustainable management of wildlife or ecosystems" (p. 363). This can be seen as another way to define stewardship which can also be easily connected to both the concepts of sustainability and conservation. Holling (1996) stated, "Natural resource management should strive to retain critical types and ranges of natural variation in ecosystems" (p. 334). This implies that corrective actions are not being taken to change the natural processes which already exist within the ecosystem. By taking these actions, "ecosystem resilience and the organizing processes and structures of ecosystems will be maintained, thus better serving not only the natural functions and species diversity of those systems

but also the long- term (although not necessarily short-term) interests of humanity (Holling, p. 334). Both environmental stewardship as well as natural resource management practices are implemented by individuals and organizations not to change the natural processes of ecosystems, but to maintain and enhance the natural processes that already exist within them.

In order for the natural processes of an ecosystem to be maintained and enhanced organizations and the members of the organization need to be working together and share the same goal. Fenwick (2007) stated that "organizational development for ecological sustainability appears to be closely linked to a general ethical commitment to the primacy of sustainability principles shared among organizational members – a commitment that ignites and supports the implementation of such practices" (p. 633). This helps to exemplify that the practices of an organization are closely related to the views and values that individual members of the organization have already established for themselves. It is important to recognize that within organizations the success of the environmental protection practices depends on the influence of certain stakeholders in the organization. It also depends on whether they have enough influence over the organization. According to Sharma and Henriques (2005):

> Several stakeholders considered secondary by managers in the past, such as local communities, non-governmental organizations (NGOs), and international regimes (such as the Intergovernmental Panel on Climate Change which coordinated the Kyoto Protocol), have become more salient in assessing the social and ecological impacts of business. (p. 161)

Stakeholder influence has become an increasingly important and influential factor that has been incorporated into the decision-making process and the daily operations of several different organizations. Without the influence that certain stakeholders have over organizations, there would not be nearly as much progress made in terms of those organizations becoming more sustainable. However, there are certain organizations that put more effort towards enhancing their sustainability practices when compared against other organizations in similar or differing industries.

Environmental sustainability and conservation biology practices are put in place to protect all natural areas of the planet including areas on the land as well as in the ocean. Individual organizations and overall industries have the potential to be a positive influence on others and begin to implement these kinds of practices into the daily operations of their businesses. One example of an industry that has chosen to put sustainable actions into place in order to decrease their currently negative impact on the environment is the IT industry. According to Murugesan (2008), "Manufacturing computers and their various electronic and non-electronic components consumes electricity, raw materials, chemicals, and water, and generates hazardous waste" (p. 25). This industry is attempting to decrease these currently negative impacts by implementing a concept called Green IT which refers to IT that is environmentally sound (Murugesan). Murugesan stated that "Green IT benefits the environment by improving energy efficiency, lowering greenhouse gas emissions, using less harmful materials, and encouraging reuse and recycling" (p. 24). This is an important example of an industry that is making progress and creating a new standard that encourages other industries to follow the example that they are setting. Another type of industry that can be used as a

good example of the positive impact that the implementation of environmentally sound practices can have on the environment is the zoo industry. Soulé (1985) stated, “rapid progress has been made by zoos and similar institutions in the technology and theory of captive breeding of endangered species” (p. 732). For certain endangered species, captive breeding as a conservation biology technique has been one of the primary reasons that the species still exists today. Zoos everywhere are committed to protecting animal species and scientists continue to improve conservation biology technology and techniques in order to further increase the survival of species (Soulé). Both the IT industry and the zoo industry are beginning to take responsibility for their past non-environmental practices and are changing the way that their businesses operate to include these new sustainability and conservation practices.

While there are several industries that are individually taking steps to contribute to the survival of the planet, other industries need to follow these examples and improve their own damaging habits for the impact on the environment to be significant. Sharma and Henriques (2005) stated, “While individual forestry firms can potentially develop strategies to maintain and renew their resource base for future generations, the path toward sustainability requires changes in business models, appropriate technologies, scale of operations, organizational forms, and performance objectives” (p. 160). This helps to prove the point that these kinds of structural changes must be implemented within more than just a few individual organizations and instead within organizations across all industries in order to make a difference for the entire planet. If every organization made the effort to be environmentally responsible and

sustainable in their decision-making process and their operations, the planet would be able to thrive instead of continuing to deteriorate at a dangerous rate.

## Purpose of the Study

The purpose of this study was to examine the environmental sustainability and conservation biology practices of the National Parks Service.

## Research Questions

This study attempted to answer the following research questions:

1. What conservation biology practices are being implemented by the National Park Service?
2. What environmental sustainability practices are being implemented by the National Park Service?
3. How effective are the conservation biology practices being implemented by the National Park Service?
4. How effective are the environmental sustainability practices being implemented by the National Park Service?

# Chapter 2

# METHODS

The purpose of this study was to examine the environmental sustainability and conservation practices of the National Parks Service. This chapter includes the following sections: description of organization/s, description of instrument, and description of procedures.

## Description of Organization

A case study was conducted on the National Park Service. The National Park Service, which is a federal bureau in the Department of the Interior, was established on August 25, 1916 after an act was signed by the president at the time, Woodrow Wilson (National Park Service, 2019). When it was first established, the National Park Service was responsible for protecting and managing the 35 national parks and monuments that existed at the time. Since then, many more parks and monuments have been created or established and the National Park Service now protects and manages over 400 areas "covering more than 84 million acres in 50 states, the District of Columbia, American Samoa, Guam, Puerto Rico, Saipan, and the Virgin Islands" (National Park Service, para. 5). New monuments or protected areas added to the National Park Service can be created by acts of Congress and these acts are the only way for new national parks to be established. All national parks and services are managed by the National Park Service, which are valued at around 92 billion dollars (Seger, 2016). Today, there are over 20,000 employees that work for the National Park Service and make it possible for existing

natural lands and monuments to be protected. These employees also work with the local communities to help preserve the natural history of the area and also provide people with local recreational opportunities (National Park Service). The mission of the National Park Service is to preserve the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The National Park Service works with several different partners "to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world" (National Park Service, para. 4).

## Description of Instrument

The instrument utilized in this study was a case study guide developed by the researcher (see Appendix A). The guide that was created includes three main columns labeled questions/ areas, description, and additional comments. The question/ area column contains five separate categories that were researched. The description column contains the specific information found by the researcher that was related to the selected category. The additional comments column contains any extra information that was found that was related to the selected category.

A pilot study was conducted on a similar organization to test the instrument. After the pilot study, the guide was changed to not include the question/ area labeled roads. After the pilot study, it was also revealed that facilities and structures could be merged into a single question/ area and so this was changed on the guide.

Description of Procedures

A case study was conducted on the National Park Service. The instrument utilized in this study was a case study guide developed by the researcher. Data were collected over a two-week period in May 2019 by the researcher. The primary source of information utilized by the researcher was the organization's website. Several different tabs on the organization's website were used including the about us tab as well as the explore nature tab. A secondary source of information was third-party sources. These third-party sources included the National Park Foundation website, the Mother Nature Network website, and the National Parks Conservation Association website.

# Chapter 3

# PRESENTATION OF THE RESULTS

The purpose of this study was to examine the environmental sustainability and conservation biology practices of the National Parks Service. A case study was utilized to examine the National Park Service. This chapter includes the following sections: conservation biology practices and environmental sustainability practices.

## Conservation Biology Practices

The National Park Service utilizes conservation biology practices in order to protect both plant species as well as animal species that are present within the natural areas that are being managed. One area that has exhibited these practices is the Golden Gate National Recreation Area. A low growing shrub, known as Franciscan manzanita, that was previously thought to be extinct was discovered near Golden Gate Bridge in San Francisco. The single plant that was found, along with its entire root system was then transported to the Golden Gate National Recreation Area where botanists now use cuttings from this plant to grow new plants. This type of conservation biology is done with the hope of reestablishing the plant into new habitats throughout the city. These practices are also taking place at Grand Canyon National Park in Arizona. The sentry milk-vetch plant was continuously being trampled on by visitors almost to the point of extinction. Once this was discovered by the National Park Service, an entire parking lot was taken out because it was located where the last population of the species was known to exist. This action limited foot traffic to the area which decreased the chances of any

plants being trampled. Staff also began to use nurseries to grow new populations of the species that were then planted in several different areas of the park. In addition to plant conservation practices, there are several natural areas managed by the National Park Service that are implementing wildlife conservation practices.

At Canaveral National Seashore, in Florida, the number of green sea turtle nests was decreasing at an alarming rate. Green sea turtles are an endangered species and staff members at Canaveral National Seashore have been taking several steps to try and help recover the species. In order to keep predators from destroying and feeding on the sea turtle nests, staff have implemented a nest screening program which allows the nests to be thoroughly monitored. Another conservation technique that has been implemented at Canaveral National Seashore is to make it possible for turtles to escape from trawling nets. This is done by the use of a turtle excluder device. These conservation measures have been implemented by the employees of Canaveral National Seashore in order to further protect the endangered species that continue to reside in this area. Another area where the National Park Service has taken on the responsibility of protecting threatened species is at Buck Island Reef National Monument. Here, the Saint Croix ground lizard was extirpated from the main island after the invasive Indian mongoose along with feral cats and dogs caused the entire species on that island to disappear. The Park Service then began to establish a recovery plan for the species and with a small population surviving at a wildlife refuge on a nearby island they began to take action. After eliminating the mongoose species on another nearby island, a small population of the species was then brought over to the new island and over several years the population was able to increase significantly. Because of this increase, the Park Service may be able to reintroduce the

population back onto the main island which will allow the species to become reestablished. These conservation efforts made by the National Park Service have made it possible for entire species of plants and animals to continue to exist.

Environmental Sustainability Practices

Sustainability practices are also being implemented by the National Park Service in order to protect the natural lands, maintain safe water sources, and avoid degrading the natural landscape with sustainable facilities and structures. One of the locations where these practices are being implemented is the John Muir National Historic site. In order to enhance and protect the natural landscape at this site, National Park Service staff as well as volunteers began to take actions in order to limit the amount of debris that was sent off-site and to limit the use of synthetic fertilizers. In order to achieve this, compost bins were added to all facilities in order to collect any food waste and large compost piles were established and thoroughly monitored and maintained by employees. The fully finished compost was then distributed and used to fertilize the landscape eliminating the need for harmful synthetic fertilizers.

The protection of natural water sources is also an important part in maintaining the quality of the water and protecting the environment. Located in Yellowstone National Park, the lowermost reach of Reese Creek is often reduced during certain months of the year due to irrigation by landowners that live near the park boundary. Due to this reduction, the creek's water flow becomes unsuitable to the point where native trout populations and the overall biological integrity of the creek are threatened. Sustainability and conservation projects are being put into place in order to increase the water flow of

Reese Creek into the main channel. Also located in Yellowstone National Park, Soda Butte Creek was discovered to be contaminated with metals due to previous mining activity and these metals continue be present in areas of the floodplain. In an effort to decontaminate this creek, federal and state agencies worked for three years to relocate mine tailings away from the floodplains in the park and also to reconstruct the formerly existing channel. These sustainable actions help to preserve the natural waters that currently exist as well as improve the water quality conditions of the natural waters when unnatural factors negatively impact them.

The National Park Service also incorporates sustainable decision making into their planning process when it comes to creating and adapting facilities and structures. Several policies and guidelines have been put into place in order to ensure that the National Park Service continues to be recognized as a sustainable organization. Many of these policies and guidelines can be found in the National Park Service Sustainable Buildings Implementation Plan. The National Park Service has taken this implementation plan very seriously. In order to comply with guidelines established by the Energy Policy Act of 2005, building level utility meters are to be installed into all building projects including new buildings as well as buildings that are being renovated. These new utility meters allow the projects to be fully monitored in order to continually optimize performance. They also allow for important data to be fully analyzed and compared against previous year's data in order to further improve their operations. The National Park Service also worked to use landscape and irrigation strategies that are more water efficient. These strategies include reducing outdoor potable water consumption through water reuse and recycling in addition to implementing design and construction strategies

as a way of reducing both storm water runoff and runoff from polluted areas. In addition to the policies stated above the implementation plan that was established by the National Park Service has several other minor policies in place. The implementation plan ensures that the organization is limiting natural resource consumption, reducing greenhouse gas emissions, creating healthy buildings and facilities, and being energy efficient in all of its daily operations.

# Chapter 4

# DISCUSSION AND CONCLUSIONS

Incorporating environmental sustainability and conservation biology practices into the daily operations of an organization can have a positive impact on the health of the natural environment. The National Park Service is one organization that has made incorporating these practices a priority. This concluding chapter includes the following: a discussion of the findings, limitations of the research, conclusions based on research questions, and recommendations for the future.

## Discussion

The National Parks Service has been involved in ensuring the survival of several species of plants and animals through the implementation of several conservation biology techniques. These techniques have proven to be both innovative and successful throughout several different environmental areas that are managed by the National Park Service. According to Soulé (1985), technology is continuously being improved in order to create conservation biology techniques that are as effective as possible. The techniques used are constantly changing and improving which allows organizations, such as the National Park Service, to protect species that are being threatened by unnatural and often human related factors. The effectiveness of these techniques can be seen through the successes that the National Park Service has had in increasing the number of species and moving a variety of species in the direction of a full recovery. The National Park Service should continue to improve the technology that is being used and can continuously do

research on other organizations in order to find what other technologies are being discovered and created.

When it is discovered that a particular species is rapidly declining in numbers, the employees of the National Park Service are quick to take action. Species that are in trouble are not ignored and conservation biology practices are implemented as fast as possible in order to further increase the species' chance of recovery and survival. In order for this to be the case, the National Park Service and its employees must be willing to dedicate time and resources to the cause. Conservation biology projects that are working towards the recovery of a species may take months and even years to see the results of the continuous work that the organization and its employees are putting into the project. According to Fenwick (2007), the implementation of environmental protection practices is closely related to the views and values of the individual members of the particular organization. The results helped to exemplify just how dedicated the employees of the National Park Service are to the protection of the natural environment and the species that live within it. This discovery can also be directly related the National Park Service as an organization. Monitoring species is an important part of being able to discover that a species may be in trouble. The National Park Service should ensure that employees are well educated on how to be able to recognize when a species is being threatened. This may allow for a quicker detection of species in need and the species will be able to recover more easily without decreasing to dangerously low numbers before being detected.

The National Park Service has also incorporated several sustainability techniques in order to further protect the natural environment and ensure that the organization is

achieving its mission to preserve natural spaces and resources for future generations to enjoy. The National Park Service has demonstrated that sustainability is an important factor that is taken into consideration throughout the designing and planning process of new and renovated buildings and facilities. The organization has also changed the way that certain natural areas are being maintained in order to make better use of the resources that are available and enhance the natural processes that already exist. Holling (1996) stated that actions should be taken to maintain and strengthen the already existing natural processes of an ecosystem as opposed to changing those natural processes. The National Park Service strives to achieve this and implement corrective actions without further damaging the existing natural environment. The National Park Service should continue to maintain and enhance the natural systems such as the existing landscapes and natural water sources. The organization should also remain educated on the latest sustainability technologies in order to incorporate them into the daily operations of the organization and further improve the facilities and structures that are being built and renovated.

There were several limitations that may have impacted this study. One major limitation is that most of the data that was found on the organization's practices came from the organization's own website. This information may have been incomplete and could have only listed the positive aspects of the types of practices that the organization was implementing purposely leaving out any negative aspects of the organization. Another limitation that could have influenced the study was the researchers own personal bias. The researcher has prior experience spending time in the outdoors as well as visiting several national parks. This personal connection that the researcher has with the natural environment may have caused the researcher to unintentionally come across as praising

the National Parks Service instead of remaining completely objective. Another limitation that may have impacted the study is time. The researcher only conducted research over a two-week period which may not have been enough time to gather the full amount of information that exists on the National Park Service. Even with these limitations, the researcher was able to find valuable research on the conservation biology and environmental sustainability practices that are implemented by the National Park Service.

The National Park Service has made major progress as an organization by implementing conservation biology and environmental sustainability practices. By implementing these types of practices several species that would not exist today without the help of the National Park Service have been able to increase in number and some have even fully recovered. Natural lands and waters are being preserved and enhanced by the organization in order to restore the natural processes of the area. Facilities and buildings are being created and renovated to include more sustainable energy and water sources. The National Park Service is a sustainable organization that is implementing all of these practices to limit the harm that it may be causing and to ensure that the natural environment is being protected as best as possible.

## Conclusions

Based on the findings of this study, the following conclusions are drawn:

1. The National Park Service is constantly improving and implementing conservation biology techniques, such as captive breeding, that are used to help threatened and endangered species be moved in the direction of recovery.

2. The National Park Service has created an entire Implementation Plan with guidelines to ensure that all facilities and natural resources are created and maintained sustainably.
3. The National Park Service and its employees are quick to take action once it is discovered that a species is in danger of going extinct and remain dedicated to the recovery of a species no matter how long it takes.
4. Sustainable decision making is incorporated into everything that the National Park Service does throughout its daily operations and sustainable measures are taken to maintain and enhance natural processes.

## Recommendations

Based on the conclusions of this study, the following recommendations are made:

1. Organizations within the outdoor industry should remain educated on the sustainability and conservation techniques that are being used by other organizations that are also within the outdoor industry.
2. The National Park Service should continuously educate employees on strategies for how to be able to recognize if a species is in danger of becoming extinct.
3. The National Park Service should continue to implement sustainability practices in order to maintain and enhance the natural landscape and water systems that exist within the organizations boundaries.

4. The National Park Service should stay well informed on the new sustainability technologies that are being created in order to further improve the facilities and structures that are being built and renovated.
5. The National Park Service should continue to research new conservation biology and environmental sustainability technologies that are being created and used by other organizations.

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APPENDIXES

Appendix A

Instrument

| **Questions/ Areas** | **Description** | **Additional Comments** |
|---|---|---|
| Land | | |
| Water | | |
| Wildlife | | |
| Plants | | |
| Facilities/ Structures | | |